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Preparation of the 2004 Integrated ) Docket 03-IEP-01  
Energy Policy Report (IEPR) Update )  
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## **Comments on Transmission Assessment and Valuation**

by

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### **1. Scope of California's Integrated Energy System Planning and Summary of Recommendations**

The Commission and parties to this proceeding recognize that improved planning is a necessary precursor to the development and implementation of essential energy infrastructure, including transmission and generation.<sup>1</sup> Planning can inform and guide competitive investment and identify those investments likely to be cost-effective. Strategic planning can also provide a basis for assessing long-term implications, in order to allow capital-intensive projects to go forward on a timelier basis without undue micro-management on the one hand or short-sightedness on the other.<sup>2</sup>

The long-lived, capital-intensive nature of transmission and generation investments requires that assessments should cover a 20 to 30 year time horizon and consider a wide-range of scenarios that adequately capture project benefits and energy system risks. Because transmission investments encourage the siting of specific generation technologies to take advantage of local conditions, such as high average wind speeds in Tehachapi or the presence of water for cooling, the adopted strategic planning methodology should address measures of statewide generation/resource mix diversity, realistic power flow and congestion impacts on key network elements and implications for NERC, WECC and other reliability criteria.

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<sup>1</sup> There is widespread agreement that it is urgent to improve the state's transmission planning and investment process. This urgency is reflected, for example, in current CPUC proceedings on transmission planning (I.00-11-001) and streamlining the transmission approval process (R.04-01-026).

<sup>2</sup> Despite their importance, the debates over restructuring California's electricity market during the late 1990s were characterized by the notable absence of quantitative analysis and by essentially no analysis or discussion of the effects of adverse market scenarios, such as the confluence of market conditions and costly events which occurred.

As pointed out by others, identifying and quantifying the high costs of extreme events that may be avoided by new transmission projects is important. Because of the inter-dependence of natural gas and electricity markets, more attention should be given to evaluating simultaneous risks to both systems, embodied by coordinated projections over time of measures for natural gas operations, such as pipeline slack capacity and deliverability, and including the likelihood of underpressurization at particular locations in the gas transmission grid. While electric and gas grids are generally analyzed separately at present, planning efforts should develop consistent scenarios that reflect their increasingly interdependent operation and examine contingent events likely to affect both energy systems.<sup>3</sup>

As discussed below, our summary recommendations for this transmission update are:

1. The CEC should apply strategic transmission and generation planning methods to develop long-run (20 to 30 year) energy system scenarios characterized by baseline and expected uncertainties, as well as several extreme, adverse, high-risk scenarios affecting both natural gas and electric energy systems.
2. The long-run strategic scenarios would be used to provide a framework for and guide the shorter-term studies of individual transmission projects, such as the project-specific studies developed using the CAISO's Transmission Economic Assessment Methodology ("TEAM").
3. Stress tests using high-risk, "what-if" scenarios will help identify projects consistent with long-run goals that are also capable of avoiding or reducing energy system vulnerabilities that may not be revealed by more traditional analysis of uncertainties or by the shorter time frames for typical project approval studies.
4. Although the five key principles underlying the TEAM methodology provide a useful starting point, different, more advanced modeling tools and criteria may be needed to develop long-run, strategic transmission plans.
5. By quantifying short and long-term risks, costs and benefits and using consistent, long-run scenarios, the public and other stakeholders may gain a clearer understanding of the benefits, avoided risks and need for specific projects.

## **2. Comments on Transmission Planning Methods and Workshop Discussions**

Transmission development involves long lead times, long useful asset life, pervasive impacts on future energy markets, high monetary and other (environmental/siting) costs, and long-term opportunities (e.g., corridors) that may disappear.

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<sup>3</sup> For example, the loss or underpressurization of particular natural gas pipelines would have adverse consequences for specific electric generators and transmission lines. In addition, corridors that combine gas, electric and communication lines represent energy system vulnerabilities not addressed by traditional planning criteria and scenarios.

Transmission planning and the present discussions in California revolve around two central tensions:

1. *Long-term Strategic vs. Short-term Responsive Planning.* Strategic transmission planning looks far ahead at diverse possible futures and considers a balanced portfolio of transmission and non-transmission investment options. However, the long-term strategic approach can be in apparent conflict with the need for a transmission approval process that is more streamlined and transparent. A planning and approval process with stakeholder and public participation should be strategic and long-term, as well as responsive to near-term needs and individual investment proposals.<sup>4</sup> (E.g., needs associated with Tehachapi wind development, Path 15 upgrades, and congestion in SE California<sup>5</sup>).
2. *Regulated vs. Competitive Market Processes.* Transmission represents a public infrastructure or "electric highway" supporting energy commerce and reliable delivery of an indispensable commodity. It will likely continue to depend on regulated funding mechanisms involving evidentiary and adversarial processes. This is in tension with market-based generation, which (1) should not require the same public demonstration of need and economic efficiency, but yet (2) can be strongly affected by and sometimes be in competition with transmission investment.

We believe the role of the CEC and the 2004 IEPR update should be especially focused on the long-term strategic aspect of transmission planning, and how it informs and is informed by shorter-term transmission development, siting and approval processes. The CEC's strategic perspective includes "vision" or principles, as well as concrete objectives such as identification and preservation of specific transmission corridors. Articulating these objectives requires procedures and tools for constructing, evaluating and discussing long-term transmission scenarios and strategies to make the vision understandable to stakeholders and defensible to decision makers.

A strategic process for long-term transmission planning, which we are encouraging the Commission to continue to develop, can inform the shorter-term project approval process by identifying particular objectives, such as the acquisition or utilization of specific transmission corridors and measures of progress toward fuel and resource diversity goals. These objectives would be given weight within the shorter-term project approval process along with quantitative reliability and economic benefit measures. One thing is clear: to provide meaningful guidance to shorter-term decisions and stakeholder/public input, strategic "vision" and principles must be tested by a structured, more transparent process.

The long-term strategic process and tools should construct and explore explicit energy scenarios for California's transmission needs. The scenarios would clarify important long-term

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<sup>4</sup> The public and other stakeholders need a clear view of the "forest for the trees," which would be provided by long-term strategic transmission planning, while the shorter-term, responsive approval process for evaluating individual projects must be more focused and timely.

<sup>5</sup> The CEC's strategic vision and strategic tools must be sufficiently explicit and structured to show specifically how the implementation of the strategic vision will help avoid or improve identified near-term problems.

risks and opportunities, and short-term analyses and decisions would then be tested under these scenarios. This would provide a more transparent means of examining uncertainties, than simply relying on ad-hoc individual parameter sensitivities. For example, if CAISO's TEAM method were used for valuing specific transmission investments, the CEC's strategic principles and longer-term modeling tools would be used to develop scenarios under which TEAM is applied.

As presently constituted, the CAISO's Transmission Economic Assessment Methodology ("TEAM") is more of a short-term responsive transmission planning tool than a long-term strategic planning tool, although extending the TEAM approach could lead to strategic assessments. Long-term strategic planning procedures and tools will require a different tradeoff of network and market detail (both data and simulation details, including strategic bidding) versus flexibility and transparency for addressing diverse long-range scenarios and their uncertainties. The scenarios would examine alternative network, generator and load configurations, including supply-DSM-transmission expansion tradeoffs.

TEAM represents a practical step forward, and its five key principles should be incorporated into both long-term "strategic" and short-term "responsive" transmission assessments. Such a structured approach would guide investors and help the State avoid the kinds of transmission upgrade and development problems recently experienced.

How might long-term strategic tools and scenarios be made consistent with shorter-term transmission evaluation methods? The five key principles underlying the TEAM methodology provide a starting point:

1. **A Consistent Benefits Framework.** This appears to require that even the long-term strategic planning methods incorporate a suitably disaggregated representation of loads, generators, and transmission lines combined with information on ownership and affiliation (e.g., who owns generators and which generation and transmission assets are associated with regulated and competitive load-serving entities). It also requires that assumptions be made about the ownership and affiliations of the various future generation, transmission and loads. The TEAM benefits framework is comprehensive, and, ultimately, stakeholder feedback will suggest refinements.
2. **Network Representation.** For long-term strategic assessments, the standard of physical network and market realism might be slightly below the level specified for TEAM (DC flow, voltages/numbers of lines, nodal prices, hourly flows) – perhaps with capability for flexible aggregation (fewer lines and busses) where justified.
3. **Market Prices.** Even for the near term, there is considerable uncertainty regarding how strategic bidding might occur. For this reason the CAISO Market Surveillance Committee comments on the TEAM approach recommended that a range of possibilities be considered for determining market-clearing prices. Over the long term, the range of uncertainty is high regarding bidding, as well as the affiliations and potential market power of market participants. Therefore, the strategic tools used for developing and testing scenarios should be designed and employed to accommodate generalized forms of bidding.

4. ***Uncertainty.*** It is here that the long run, strategic tools should go beyond the shorter-term evaluation methods and be designed to devise, test and evaluate a wide range of uncertainties, including extreme, high risk events. If the long-term network and market modeling is simplified from, but still generally consistent with shorter-term methods, it becomes feasible to simulate important uncertainties that can then be explored in a more focused, shorter-term evaluation process.
5. ***Alternatives to Transmission Expansion.*** This is another area where the strategic tools for developing and testing scenarios and "vision" need to go further than the short-term evaluation methods. The tools may need greater flexibility and scope (less detail) to construct and evaluate varied "what if" scenarios regarding the long-term configuration and behavior of the network-loads-generation system. For example, they could be used to examine the effects of new technologies and load patterns. Consistency and linkage with natural gas market and other resource projections and statewide energy goals (e.g., for renewable generation) is essential. Again, the broader examination of alternatives might be achieved as a tradeoff for reduced detail, while preserving adequate consistency with the short-term evaluation and project approval methods.

In conclusion, whatever "long-term strategic" vision and tools are employed, they need to be amenable to stakeholder and public understanding and participation. It may be difficult to provide the kinds of functionality suggested above, while maintaining sufficient transparency and accessibility for stakeholders and the public.<sup>6</sup> Transparency may place limits on the level of detail and aggregation – suggesting important tradeoffs. However, if there isn't a sufficiently structured and detailed methodology for quantifying and stress testing the Commission's "strategic vision," then the vision will be of limited use in guiding actual transmission decisions. Thus, we encourage the Commission to continue its efforts to develop and apply new and improved transmission and integrated energy system planning methods.

Respectfully submitted,

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<sup>6</sup> Will third parties be able to run, evaluate and benchmark the analytic tools?